

In the Claims:

1. (original) A cyclone filter for separating particles from a fluid, comprising:
a cylindrical chamber having an inlet for receiving the fluid with the particles;
a ring having a plurality of grooves,
the ring being concentric to the cylindrical chamber,
the ring having an outer diameter on a first end that is smaller than a diameter of the cylindrical chamber, thus defining a distribution channel;
an intermediate tube adapted to receive fluid from the grooves;
a collection chamber having an upper cylindrical portion connected to a substantially frustoconical portion, the collection chamber having a solids outlet located on a lower end of the frustoconical portion, an upper end of the upper cylindrical portion being connected to the intermediate tube; and
a vortex finder tube being concentric with the intermediate tube thus defining a down-flow annulus on one end and having a fluid outlet on the other end extending upwardly out of the cylindrical chamber.
2. (original) The cyclone filter of claim 1 in which the grooves in the ring are spiral.
3. (original) The cyclone filter of claim 1 in which an outer diameter on a second end of the ring is substantially equal to the diameter of the cylindrical chamber.
4. (original) The cyclone filter of claim 1 in which the ring has a depth substantially equal to a depth of the grooves therein.
5. (original) The cyclone filter of claim 1 in which an outer diameter of the second end of the ring is substantially equal to a diameter of the intermediate tube.
6. (original) The cyclone filter of claim 1 further comprising:
a deflector located within the upper cylindrical portion of the collection chamber to reverse the fluid flow and to force the particles into the lower frustoconical portion of collection chamber.
7. (original) The cyclone filter of claim 1 in which the inlet is radially disposed on the cylindrical chamber.
- Claims 8 and 9 (canceled)
10. (original) A cyclone filter for separating particles from a fluid comprising:

a cylindrical chamber having an inlet for receiving the fluid with the particles;
a ring having a plurality of grooves,
the ring being concentric to the cylindrical chamber,
the ring having an outer diameter on a first end that is smaller than a diameter of the cylindrical chamber, thus defining a distribution channel;
a collection chamber having an upper cylindrical portion connected to a lower substantially frustoconical portion, the collection chamber having a solids outlet located on a lower end and having an upper end adapted to receive fluid from one grooves; and
a tube being coaxial with the collection chamber, the tube having one end disposed inside the upper cylindrical portion of the collection chamber, the tube having another end extending upwardly out of the cylindrical chamber.

11. (original) The cyclone filter of claim 10 in which the grooves in the ring spiral involutely.
12. (original) The cyclone filter of claim 10 in which the ring has a depth substantially equal to a depth of the grooves therein.
13. (original) The cyclone filter of claim 10 in which an inner diameter of the ring is substantially equal to a diameter an upper cylindrical end of the of the collection chamber.
14. (original) The cyclone filter of claim 10 in which the inlet is radially disposed on the cylindrical chamber.
15. (original) The cyclone filter of claim 10 in which the tube is a vortex finder tube.
16. (original) The cyclone filter of claim 10 in which the grooves in the ring spiral involutely.

Claim 17 (canceled)

18. (original) A cyclone filter for separating particles from a fluid comprising:
a cylindrical chamber having an inlet for receiving the fluid with the particles;
a ring having a plurality of grooves,
the ring being concentric to the cylindrical chamber;
a collection chamber having an upper cylindrical portion connected to a lower substantially frustoconical portion, the collection chamber having a solids outlet located on a lower end and having an upper end adapted to receive fluid from the

grooves, the ring having an outer diameter that is smaller than a diameter of the upper cylindrical portion of collection chamber, thus defining a distribution channel; and

a skirt being coaxial with the collection chamber, the skirt having one end disposed inside the upper cylindrical portion of the collection chamber, the tube having another end extending upwardly out of the upper cylindrical portion of the collection chamber.

19. (original) The cyclone filter of claim 18 in which the grooves in the ring spiral involutely.

20. (original) The cyclone filter of claim 18 in which an inner diameter of the ring is substantially equal to a diameter of the end of the skirt extending upwardly out of the upper cylindrical portion of the collection chamber.

21. (original) The cyclone filter of claim 18 in which the inlet is radially disposed on the cylindrical chamber.

22. (original) The cyclone filter of claim 18 in which the grooves in the ring spiral involutely.

Claims 23 – 37 (canceled)

38. (new) A cyclone filter for separating particles from a fluid comprising:
a cylindrical chamber having an inlet for receiving the fluid with the particles;
a ring having a plurality of grooves,
the ring being concentric to the cylindrical chamber,
the ring having an outer diameter on a first end that is smaller than a diameter of the cylindrical chamber, thus defining a distribution channel;
a collection chamber having an upper end adapted to receive fluid from one grooves;
a down-flow annulus adapted to provide fluid communication between one of at least one of the grooves and the collection chamber.

39. (new) The cyclone filter of claim 38 in which the grooves in the ring spiral involutely.

40. (new) The cyclone filter of claim 38 in which the collection chamber has an upper portion and a lower portion.

41. (new) The cyclone filter of claim 40 in which the upper portion of the collection chamber further is substantially cylindrical.

42. (new) The cyclone filter of claim 40 in which the lower portion of the collection chamber is substantially frusticonical.
43. (new) The cyclone filter of claim 38 in which the grooves in the ring are spiral.
44. (new) The cyclone filter of claim 38 in which the ring has a depth substantially equal to a depth of the grooves therein.
45. (new) The cyclone filter of claim 38 in which the down-flow annulus is formed between an intermediate tube and a vortex finder tube.
46. (new) The cyclone filter of claim 45 in which an inner diameter of the second end of the ring is substantially equal to a diameter of the intermediate tube.
47. (new) The cyclone filter of claim 45 further comprising a deflector located within the collection chamber to reverse the fluid flow.
48. (new) The cyclone filter of claim 38 in which the inlet is radially disposed on the cylindrical chamber.
49. (new) The cyclone filter of claim 39 wherein the collection chamber has a lower end having an outlet valve.
50. (new) The cyclone filter of claim 38 in which the outer diameter on a second end of the ring is substantially equal to the diameter of the cylindrical chamber.
51. (new) The cyclone filter of claim 38 wherein the collection chamber has a lower end having a solids outlet.
52. (new) The cyclone filter of claim 38 in which the downflow annulus is formed between the upper cylindrical portion of the collection chamber and a tube being coaxial with the collection chamber,
53. (new) The cyclone filter of claim 52 in which the tube has one end disposed inside the upper cylindrical portion of the collection chamber and another end extending upwardly out of the cylindrical chamber.
54. (new) The cyclone filter of claim 53 in which the tube is a vortex finder tube.
55. (new) The cyclone filter of claim 53 wherein the collection chamber further comprises an upper cylindrical portion connected to a lower substantially frustoconical portion.
56. (new) The cyclone filter of claim 38 wherein the downflow annulus is formed between the upper cylindrical portion of the collection chamber and a skirt.

57. (new) The cyclone filter of claim 56 wherein the lower substantially frusticonical portion of the collection chamber comprises a cone.

58. (new) The cyclone filter of claim 57 in which an inner diameter of the ring is substantially equal to a diameter of the end of the skirt extending upwardly out of the upper cylindrical portion of the collection chamber.

59. (new) The cyclone filter of claim 58 wherein the collection chamber further comprises an upper cylindrical portion connected to a lower substantially frustoconical portion.